

Portland Protocol for Continuous IV Insulin Infusion

ICU patients Target: 70 – 110

1. Surgical Patients: Start “Portland Protocol” during surgery.
Medical & Surgical Patients: Continue Portland Protocol throughout ICU stay.
2. For patients previously undiagnosed diabetes (DM) who present with hyperglycemia: start PDX protocol if blood glucose (BG) level > 120 mg/dl X 2 consecutive readings **OR** >150 at any one time. Consult endocrinologist on POD 2 for DM workup and follow-up orders.
3. Start insulin infusion via pump “piggybacked” to normal saline IV as follows:

Blood Glucose (mg/dL)	Intravenous Insulin Bolus (U)	Initial Insulin Rate (Units/hour) (circle one)	
		Type 2 DM Preoperatively	Type 1 DM Preoperatively
80–119	0	0.5	1
120–179	0	1	2
180–239	4	2	3.5
240–299	8	3.5	5
300–359	12	5	6.5
≥ 360	16	6.5	8

4. Test BG level by finger-stick, arterial or venous line drop sample.

The frequency of BG testing is as follows:

- a. **If BG ≥ 150 or < 70 : check BG every 30 minutes.**
- b. If BG 70 -150: may check BG every hour.
- c. When titrating epinephrine, check BG every 30 minutes.
- d. When BG is 70 - 110 **and** insulin rate remains unchanged x 4hr., then may test q. 2 hrs.

5. Insulin titration:

Blood Glucose (mg/dL)	Action
< 50	Stop insulin; give 25 mL D50; Recheck BG in 30 minutes. When blood glucose > 60, restart with rate 50% of previous rate.
50–59	Stop insulin; if previous BG >100, give 25 mL D50. Recheck BG in 30 minutes When BG > 60, restart with rate 50% of previous rate. If ≥ last test result, continue current rate.
60–69	If lower than last BG by 20 mg/dl or more, decrease rate by 50% If within 20 mg/dL of last BG, decrease rate by 0.5

units/hour.

70–110	Same rate -- EXCELLENT! You are in the Target Range! TITRATE DRIP AT WILL TO MAINTAIN BG in TARGET RANGE
111–150	If < 20 mg/dL lower than last test– increase rate by 0.5 units/h. If 20 - 80 mg/dL lower than last test – keep same rate If more than 80 mg/dl lower – decrease rate by 25%.
151 - 180	If ≥ 30 mg/dL lower than last BG, keep same rate. If < 30 mg/dL lower than last test (OR if higher than last test), increase rate by 1 Unit/h Recheck BG in 30 minutes

Blood Glucose
(mg/dL)

Action

181 - 240	If ≥ 50 mg/dl lower than last test – same rate If < 50 mg/dl lower than last test OR if higher than last test -- Bolus with 4 units AND increase rate by 2 unit/hr (RECHECK BG IN 30 MINUTES)
> 240	If ≥ 100 mg/dl lower than last test – same rate If < 100 mg/dl lower than last test OR if higher than last test -- IV bolus with regular insulin as per “Initial IV Insulin Bolus” dosage scale above (see Item #3) AND Double Insulin drip rate (RECHECK BG IN 30 MINUTES)

> 300 X 4
consecutive readings Call MD for additional IV bolus orders.

NOTE If BG 151 – 240 mg/dl and has not decreased after 3
consecutive increases in insulin, then bolus with 4 units
and double insulin rate.

6. 1800 ADA Diabetic diet starts with any PO intake – Begin with Full Liquids and advance as tolerated.

7. **Post meal S.Q. Humalog Insulin Supplement** in addition to insulin drip at mealtimes:

If consistently eating, give S.Q. Humalog 15 min. premeal;

If uncertain of oral intake, then give postmeal.

- a. **Test BG 2hr after SQ Humalog. If > 125, then increase next meal-related dose by one “row”. If < 80 decrease next meal-related dose by one “row”.**

Drip Rate	Eats > 50% of meal	Eats < 50% of meal
0-2	4 units SQ	2 units SQ
2-4	6 units SQ	3 units SQ
4-6	8 units SQ	4 units SQ
6-8	10 units SQ	5 units SQ
8-10	12 units SQ	6 units SQ
>10	14 units SQ	7 units SQ

Furnary AP, et al. *Endocr Pract.* 2004;10:21–33.